



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,754	02/22/2002	Gerald W. Fly	8540G-000058	9350
27572	7590	01/13/2005		
HARNES, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303				
			EXAMINER CHANEY, CAROL DIANE	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/080,754

Applicant(s)

FLY ET AL.

Examiner

Carol Chaney

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 10-18 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-25 is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-18, 20 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11 November 2004 has been entered.

Specification

The amendment filed 11 November 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The recitation of "impermeable, conductive separator plates" is not supported by the specification as filed.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 1745

Claims 1-6, 10-18, 20, and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation of "impermeable, conductive separator plates" is not supported by the specification as filed.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 10-18, 20, and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "impermeable...separator plates" is indefinite because the claim does not recite materials to which the separator plates should be impermeable. A plate made of certain titanium alloys, for example, could be impermeable to water, but permeable to hydrogen.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 1745

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 3, 13, 15 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Cipollini (U.S. Pat. No. 6,258,476).

Cipollini discloses a solid polymer membrane fuel cell which includes a membrane electrode assembly having a membrane (2), with a first catalytic layer (3) on a first face of the membrane, and a second catalytic layer (7) on a second face of the membrane. Bipolar plate assembly (13, 14) is adjacent the anode catalytic layer (7) and is in electrical contact with the catalytic layer. The surface of the anode gas flow field plate (13) contacts a gas impermeable member (14). See Cipollini, column 5, lines 31-34.) Thus, layer 14 is nonporous and gas impermeable. The bipolar plates, reference 4 and references 13 and 14 include gas distribution layers having a plurality of highly porous reactant gas flow channels (8) or (13) which extend transversely through the gas distribution layers, in generally parallel orientations. (See Fig. 2.) Clearly, the

porous reactant gas flow channels (8) are in fluid communication with catalytic layer (3).

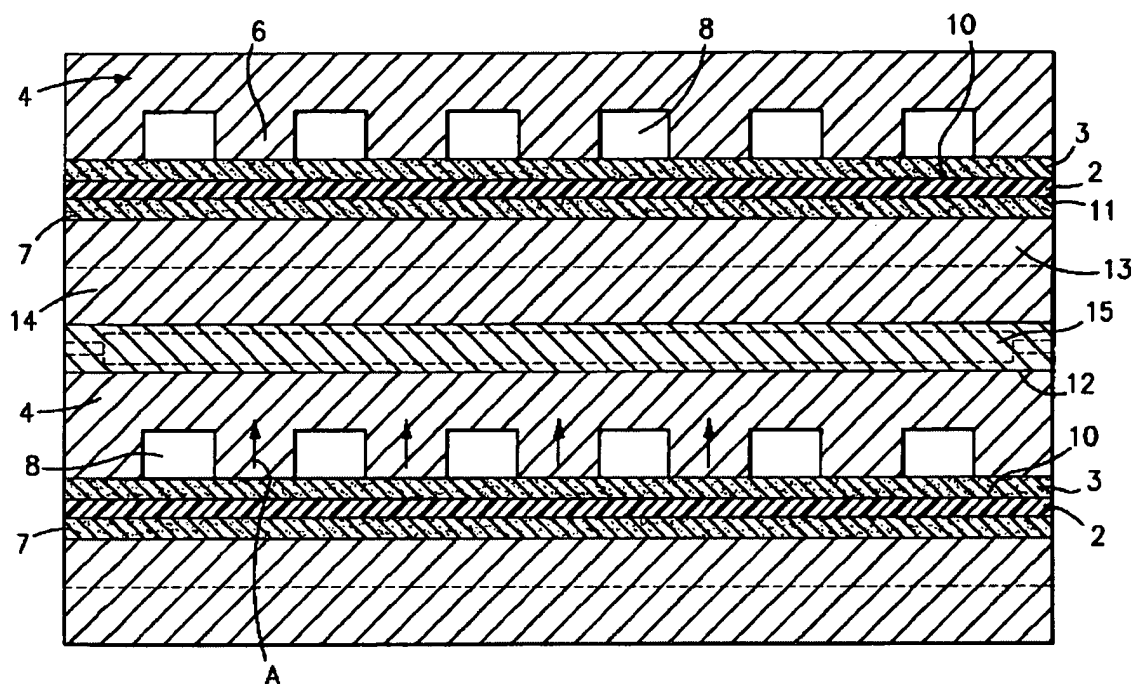


FIG. 2

The presence of water in "transfer member" or bipolar plate assembly (4) prevents cathode reactant gas from migrating from the gas passages through the transfer member. (See Cipollini, column 5, lines 51-54.) Thus, the upper layer of plate 4 is impermeable to cathode reactant gas.

Claims 2, 4, 9, 10, 14, 16, 18, rejected under 35 U.S.C. 103(a) as being unpatentable over Cipollini for reasons of record.

Allowable Subject Matter

Claims 6-8, 11, 12, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With regards to claim 8, the prior art does not suggest a fuel cell with a convoluted membrane electrode assembly and a convoluted surface of a gas distribution layer. With regards to claims 11 and 12, the prior art fails to suggest a fuel cell comprising a porous conductive interface layer between a gas distribution layer and a catalytic layer. With regards to claims 20, 21, 6 and 7, the prior art does not disclose or suggest the fuel cell structure as claimed, wherein leg portions and barrier portions are formed within the porous reactant gas flow channels.

Claims 22-25 are allowed.

Response to Arguments

Applicant's arguments filed 11 November 2004 have been fully considered but they are not persuasive.

Applicants argue that Cipollini teaches the use of a porous and thus permeable separator plate, noting that water is able to pass through the water transfer plate 4 and into the coolant water channel 15. The plate is impermeable to reactant gas, (see column 5, lines 51-54) and although the plate is initially a "fine pore plate", when the plate is placed in contact with water, any void volume in the plate is filled, so the plate becomes non-porous in operation.

Art Unit: 1745

Applicants submit that Cipollini fails to teach porous reactant gas flow channels as recited in claim 1. In response, it is noted that the reactant gas flow channels 8 and 13 disclosed by Cipollini are considered porous since the channels contain voids.

Applicants assert Cipollini fail to teach channels which include porous media having an average pore size of no greater than 0.25 mm and a void fraction of no less than 85% as recited in claim 2. As discussed above, the flow channels disclosed by Cipollini are considered to contain porous media, and as discussed in previous office actions, it is clear to one of ordinary skill in the art that porosity will effect gas permeability, which will effect gas flow, which will effect output voltage of a fuel cell. Thus, it would have been obvious to one of ordinary skill in the art to adjust porosity and permeability of the separator plates and bipolar plates disclosed by Cipollini in order to achieve the desired operating properties of a fuel cell.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Carol Chaney
Primary Examiner
Art Unit 1745

10 January 2005